REMARKS

The Office Action of October 10, 2007, and the cited art have been carefully considered. The application has been amended to eliminate unnecessary limitations and to correct grammatical and similar errors. Reconsideration of the rejection of the application is respectfully requested based on the amendments and following discussion.

OBJECTIONS

1. Claim 25 was objected to for a grammatical informality.

Claim 25 has been cancelled.

REJECTION 112

2. Claims 1, 3-6, 8, 10, 12-18, and 21-28 were rejected under 35 USC 112 second paragraph.

Claims 1, 3-6, 8, 10, 12-18, and 21-28 have been cancelled.

REJECTION 103:

2. Claims 1 - 5, 6 and 7-24 were rejected under 35 USC 103 over Cooper US 3,277,330 in view of Bell US 5,886,466, Agte US 1,854,970, DeCaro US 4,463,277 and bird US 3,237,284.

Claims 1-5, 6 and 7-24 have been cancelled.

Cooper '330 shows a carbide lamp with a fill having a source of carbon and nitrogen. The nitrogen in Cooper '330 is an essential feature. It is the cyanide radical that Cooper '330 uses to sustain the carbide filament. All of Cooper's fills include nitrogen or ammonia a source of nitrogen. All of Cooper's claims are for fills including a cyanide radical. In contrast the Applicant specifically excludes nitrogen.

Cooper '330 discloses the use of carbon source and the use of halogens in a carbide lamp, but in each case for the purpose of sustaining the cyanide radical generation process. Cooper '330 also fails to describe a metal-halogen cycle as in the Applicant's application. The Examiner's cited references to the halogen cycle refer to the carbon cycle, or not to any metal halogen cycle. Further, there is no suggestion in Cooper '330 that two differing cycles can be sustained in a carbide lamp at the same time. The first cycle being the carbon cycle and the second cycle being the halogen cycle.

Bell '466 shows a small tungsten halogen lamp with a standard tungsten halogen chemistry. It is well known in the art of standard lamp making that carbon, hydrogen, and sulfur are destructive of the tungsten filament. There is no suggestion in Bell '466 to use a carbide filament, to add carbon as a fill material, to include hydrogen as a fill material, or to include hydrocarbons as fill material. Such inclusions in a standard halogen chemistry would be destructive. The fact that there are tungsten halogen lamps, and some of them are small, does not mean the tungsten halogen chemistry could or should be added to a carbide carbon chemistry. Cooper does not suggest that. Bell does not suggest that. The typical lamp designer would know the two chemistries would intermingle and would likely generate all sorts of halo-metallic hydrocarbon species that would coat the envelope wall darkening the lamp. The suggestion that just any combination of a halogen process to a carbide lamp is going to work is unsupported speculation. The combination in general and the claimed solution in particular are not made obvious by the cited references.

Regarding claims drawn to sulfur fills, including CS; Cooper '330 and Bell '466 make no mention of any sulfur fill component. It is generally known that sulfur frequently acts like oxygen in chemical reactions and that oxygen is terribly destructive to a hot filament. Sulfur should cause the same destruction. There is no support in the cited references and it is not obvious from chemical practice that sulfur might or should be added to a tungsten halogen lamp; to a carbide-carbon lamp; or even more remotely to a carbide-carbon, metal halogen lamp. Bird '284 only suggests only the specific combination of exactly "carbon and sulphur." Notice that other combinations are exactly stated, for example "carbon, hydrogen and at least one halogen." Bird '284 is being exact in specifying "carbon and sulfur," and meaning an exact combination only carbon and sulfur excluding hydrogen, halogens, and any others. Bird '284 then only suggests a combination of "carbon and sulphur only" may be used in lamps with a tantalum carbide filament. No concentration ratios are described, nor are the other additive elements that Applicants claim permitted. It is not sufficient to add an arbitrary amount of sulphur to just any fill gas. The Applicants have found that sulphur helps only if the other elements described are present in the appropriate concentrations described.

While Agte '970 does show the use of a rhenium core in a tantalum carbide coated filament, Agte '970 fails to show, teach, suggest or make obvious any of the fill chemistries that are central to the Applicant's parent claims.

Regarding claims drawn to iodine and hydrogen; Cooper '330 and Bell '466 make no mention of any iodine being used to stabilize hydrogen. Cooper '330 and Bell '466 do not combine iodine and hydrogen in the fill and do not make the combination obvious. Since water is a common pollutant in lamps, the control of water materials is important to lamp construction. The references do not show, teach or suggest the use of iodine as a mechanism to stabilize hydrogen in a halogen lamp fill.

Regarding claims drawn to limitations on the concentrations of fill materials, it is a central objective of the application that the chemistry be useful in small lamps, with modest wall temperatures. The claimed concentrations have been found to not cause deposits on the lamp walls, and to operate over the range of temperatures that exist in small lamps with modest wall temperatures. Prior art lamp cycle chemistries are known to have limited operating temperature ranges which are determined in part by lamp size and normal lamp operating conditions. The references do not show, teach or suggest which chemistries to use, or which concentrations of those chemistries work given the vast number of possibilities. The references simply do not make obvious these particular chemistries and concentrations for use in a combined metal-halogen and carbon-carbide cycle lamp.

Regarding claims drawn to the use of bromine and iodine, Cooper, Bell and DeCaro do not described the use of the claimed materials in the claimed concentrations. Cooper, Bell and DeCaro do not show or use the two halogens bromine and iodine in any case and do not show or use the particular claimed concentrations of bromine and iodine. The purpose of the iodine is to stabilize the content of hydrogen in quartz lamps, and this is not described in the cited references at all.

Regarding claims drawn to relative concentration ratio, none of the references shows, teaches or suggests such design rules. The Applicants have found systems of chemistries that work to sustain the two cycles, and importantly have found design rules governing relative concentrations that are generally operable. Concentrations outside of these design rules have been found or are believe to be less operable, resulting in poor lamp performance.

It is believed that a full and complete response to the Office Action has been made, that the Application as amended is patentably distinct over the cited art, and that the case is now in condition to be passed to issue. Reconsideration of the amended application is therefore requested, and an early favorable notice of allowance is courteously solicited.

Respectfully submitted,

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